WHERE ANGELS FEAR TO TREAD: AN ANALYSIS OF SEX DIFFERENCES IN SELF-CONFIDENCE

by Sarah A. Burnett

Society's recent efforts to deal with the inequities of sex discrimination have raised a number of questions concerning the comparative psychological characteristics of men and women. For example, do the sexes differ in the kind or degree of emotional reactions that they express toward people and events? Do they differ in the style or vigor with which they attack their life problems? Are their basic value systems comparable? Do they have similar aptitude profiles, particularly with regard to the knowledge and skills required in many of the traditionally sex-typed occupations?

If measurable psychological differences do exist in any or all of the above areas, are these differences of any practical significance—that is, are they great enough, on the average, to limit or direct the kinds of lives members of the two sexes may reasonably be expected to lead? And most important of all, where measurable differences do exist, what are their origins? Are they inevitable—perhaps even genetic—or are they the product of social stereotyping and hence subject to gradual elimination through social change?

Few, if any, of these questions have yet been resolved satisfactorily; some, in fact, may never be answered until the social changes necessary to reduce sex stereotypes have been in effect long enough to permit observation of their effects. Still, evidence has been accumulating rapidly both in support of some psychological differences that appear to be real and refuting others that, once believed to be real, now appear non-existent.[1]

It is not the purpose of this paper to review or criticize the evidence on all the current issues, important though they may be. Rather, I shall attempt to examine in depth one area of research on sex differences that has far-reaching implications in both education and employment. In a word, the problem is that of self-confidence. Are men *generally* more self-confident than women in achievement situations, as is commonly believed? Or is the purported

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difference more likely a matter of the specific tasks and skills toward which confidence is expressed? And if differences in self-confidence do, in fact, exist, what are the implications? The remainder of this discussion will be addressed specifically to these questions.

Are males more self-confident?

The evidence on this question is plentiful but also somewhat paradoxical. Most of the pertinent literature has been reviewed recently by two psychologists, Eleanor Maccoby and Carol Jacklin, in their monumental work, *The Psychology of Sex Differences.* What they seem to have found is that the sexes are highly comparable with respect to all the psychological elements that might be expected to comprise the feeling of self-confidence. Yet when it comes to actual measurement of self-confidence, women are found to be wanting—a paradox that deserves further scrutiny.

First, let us look briefly at the kinds of evidence that Maccoby and Jacklin have marshalled on these two points. In the case of intellectual ability, they analyzed over fifty large-scale studies involving such widely used tests as the Stanford-Binet, the Thurstone Primary Mental Abilities Test, the ACT, and the ACE, and concluded that the sexes do not differ in either general intellectual ability or academic aptitude. Neither were there consistent overall differences in tests or studies aimed at measuring creativity, need for achievement, task persistence, or self-esteem,[2] all of which have at one time or another been considered important for achievement, confidence, or both.

In the case of direct measurement of self-confidence, Maccoby and Jacklin's evidence favoring a sex difference seems, on the surface, just as compelling as that used to refute the aptitude difference. Before considering their evidence, it might be well to examine the operations used in its measurement.

Attempts to quantify self-confidence have taken a number of forms, including task preference (how difficult a task the subject chooses), persistence (how long the individual will work at it), goal-setting (what standard the individuals set for themselves), and self-evaluation (how much better or worse the subject expects to do than some reference group). One of the most commonly used indices, known as *success expectancy*, requires the individuals to predict or estimate their chances of success on the particular task in question (e.g., how many darts, out of ten, do they expect to land within a specified target; or what grade do they expect to make on the next exam; what are their odds of getting the next problem correct).

An example of the evidence reviewed by Maccoby and Jacklin includes a study by Rychlak and Lerner, who administered six performance tests of manual dexterity to college students of both sexes.[3] Prior to tests 1, 5, and 6, each participant was required to state his or her expectancy for success. Although male and female expectations were similar prior to tests 5 and 6, men had a higher expectancy for success prior to test 1. Hence, it may be

inferred that men approached the test with a greater degree of self-confidence. In another study involving a motor skill, this one requiring fifth graders to drop marbles into holes from a prescribed distance, achievement expectancies were obtained before and after each of two sessions. Once again, boys had higher initial achievement expectancies than girls, although there were no differences in the later session.[4]

Not all the differences in self-confidence involved motor skill tasks. V. C. Crandall found women to have less initial confidence in a novel intellectual task, a digit symbol matching task, and prediction of their own future recall.[5] Later tests of performance revealed that males were overestimating their future performance while the females were underestimating what they could actually achieve. Both Feather and Simon[6] and House and Perney[7] reported studies showing that female college students expected to do less well than their male counterparts at an anagrams task. In a very different type of experimental task, Feldman-Summers and Kiesler found that college women expected to be less successful than their male peers when asked to imagine themselves practicing in each of seven professions.[8] Of course, one might interpret this finding as an accurate reflection of our society's treatment of women professionals rather than as an illustration of female underconfidence.

Another area in which females appear to have less confidence than men, and one which relates strongly to achievement behavior, is willingness to take risks. One might argue that little true achievement can take place without a certain amount of risk. The classic study on sex differences in risk-taking was carried out by P. Slovic, using children as subjects.[9] The key element in this study was a machine that dispensed M&M candies in response to pulling switches. Pulling any of eight (out of nine) switches produced the reward; pulling the ninth switch, however, resulted in the loss of all accumulated M&M's and a termination of attempts. The location of the ninth, or "disaster," switch was varied so that the subject would have no way of identifying it in advance. Each switch could be pulled only once, and participants could quit at any time. Willingness to take risks was inferred from persistence in pulling switches: obviously, as the number of untried switches decreased, the chance of pulling the "disaster" switch—hence, the risk—increased. Once again, clear sex differences emerged, with males having a significantly greater risk-taking preference than females. One interesting point, however, is that the total winnings earned by the males were *less* than those for the females. Thus, whereas the males took more risks, the conservative strategy preferred by the females proved far more advantageous.

Considered together, studies such as these would appear to lend impressive support to Maccoby and Jacklin's conclusion. Returning to our original question, then, the answer suggested by the available evidence is yes, women do tend to be less self-confident than men—less, frequently, than is justified in light of their subsequent performance. Before attempting to deal with the

possible answers to the puzzling question of why this should be so, let us consider a few possible implications of lowered self-confidence.

Does it really matter?

If women, in general, do have lower self-confidence than men, as the evidence seems to show, what might be the consequences of such feelings? There are several studies in the psychological literature which strongly suggest that such a tendency could be maladaptive; that individuals who approach tasks with a low expectation of success are, in fact, likely to perform less well than those with a high expectation of success. For example, E. S. Battle studied children's "persistence" at solving a difficult mathematics problem as a function of several variables including "expectancy" of success.[10] While IQ, social class, importance of the subject matter to the student, and several other variables were found to be unrelated to persistence, the student's expectancy of success *was* related—and substantially (correlation = .52). Battle concluded that it is the child's perception of his or her capabilities (i.e., expectation of success) which determines successful performance in those situations in which persistence is a key factor.

In a different type of study, Feather had college students attempt to solve fifteen anagrams.[11] All subjects rated their chances of success before attempting each anagram. For half the subjects, the anagrams were arranged so that the first five were insoluble, insuring failure. For the rest of the subjects, the first five anagrams were very easy, guaranteeing success. The remaining ten anagrams were the same for both groups and were rated at the 50% difficulty level (i.e., the chances were .50 that the subject would be able to solve each one). Far more anagrams were solved by the initial success group than the initial failure group, thereby supporting once more the importance of success expectations in performance.

One might suspect that differences in performance that correspond to differences in expectations are due simply to the fact that more competent people have higher expectancies than less competent people. Actual competence was not controlled in many of the studies cited by Maccoby and Jacklin, and this may account for some of the reported findings. Some investigators have, however, attempted to control for competence. One approach involves selecting subjects of strictly comparable ability and *inducing* differences in expectancy through instructions, prior information, or experience. For example, comparable subjects might be shown differential norms (indicating that their own current performance is either well above or well below "average"). Or they might be instructed that the next set of problems would be harder or easier than those previously experienced. When induced differences in expectancy have been studied, with actual competence equated, the results have generally supported the position that lowered expectations produce lowered performance.

Weiner et al. present data that suggest still further implications of lowered self-confidence.[12] Their evidence indicates that individuals who expect to perform poorly tend to choose not to engage in achievement activities, to select less demanding tasks, and to be more readily discouraged in the face of failure than do more optimistic people.

There do, then, appear to be important implications in the tendency of women to underestimate their own abilities. It *does*, or *can*, make a difference in actual performance if the woman is fortunate enough to have the opportunity to demonstrate her competence. More important, however, it may prevent her even from seeking vigorously those jobs or tasks that she might very well perform successfully. It is well established, for example, that women set lower educational and vocational goals for themselves than do men.[13]

It is clear, then, that lack of self-confidence could be a serious barrier to female achievement if, in fact, it is as real and general a phenomenon as depicted by Maccoby and Jacklin. As it turns out, there may be reasons other than some inherent female deficiency that account for Maccoby and Jacklin's conclusions. We turn, therefore, to a consideration of other possible explanations for the data on female underconfidence.

Why do women appear to lack confidence?

It is clear from the data presented so far that a preponderance of the research suggests that women lack self-confidence. A closer examination of these landmark studies, however, reveals certain flaws and biases that could greatly alter this general impression. True, women exhibited lower self-confidence in the various tasks and under the specific conditions used. But were these tasks representative of most achievement situations? There is good reason to suspect that they were not.

Two main characteristics dominate the situations used in the aforementioned studies. First, many of the tasks were ones in which men are known to perform better than women (e.g., gross as opposed to fine motor skills), or in which society has presumed that men are superior. Since actual performance and level of sex stereotyping were generally not measured, we cannot know how accurate the anticipated performance estimates actually were. We do know, however, that on tasks in which women typically perform well (such as intellectual or cognitive tasks), confidence differences are small or nonexistent. Moreover, there is evidence that both males and females perform best on tasks that are considered "appropriate for their sex."[14] Women will expect to do worse than men at kicking footballs and men will expect to do worse than women at threading needles, two strongly stereotyped tasks. In both cases, the predictions are borne out by the evidence. What is more interesting, however, is that the mere suggestion by the experimenter prior to the test that one sex "tends to do better on this" is sufficient to affect performance when, in fact, the two sexes would perform equally on that

task if no biasing suggestions were given. Thus, my colleagues and I contend that many of the studies reporting self-confidence differences used tasks which girls and women would likely consider more "masculine" or in which men or boys *should* excel: tasks involving athletics, male games such as marbles, and even mathematical puzzles. We are suggesting that sex differences in confidence are not due to a general feminine trait, but are task-specific and influenced by the perceived sex "appropriateness" of the task.

The second characteristic of earlier studies is task ambiguity. Considering their aversion to risk-taking, women could be less likely than men to express confidence in their own future success in the absence of clear, unambiguous information on their abilities. Why they might be more conservative than men in this regard is unclear, but many reasons might be offered: it has been suggested, for example, that bragging is part of the male "machismo" concept. Whatever the reasons, many of the tasks used were ones in which the female participants had little or no prior experience; therefore, the situation for them was ambiguous, another factor which could have favored males.

It should also be noted that in many of the situations studied, women tended to be at least as *realistic* in their estimates as did the men (who tended, frequently, to be overly confident). In fact, in some cases, the conservative estimates were even more accurate.

The conclusion, then, is that Maccoby and Jacklin may have been a bit hasty in their assessment of female underconfidence. It could well be that the issue is really one of *confidence for what*? It is possible that women as well as men feel particularly confident in certain kinds of tasks—probably those in which experience has shown them that they can excel.

I would like now to pursue this point, using as evidence some research that I and my co-workers, Martha Garcia, Elizabeth Sechler, and Diana Rathjen, have collected over the past few years.

The importance of specific tasks: confidence for what?

It is our contention that sex differences in self-confidence are neither as universal nor as mysterious as they have been depicted. They are limited to a rather clearly defined group of tasks, notably those with a strong male stereotype, and even these are subject to modification through experience. In short, women are "underconfident" only in situations where the available evidence gives them little other choice. Where they are expected to do as well as males, such as in some intellectual tasks, or where experience has shown that they can do as well, the sex differences vanish.

Since the majority of the research to date has failed to include such neutral task conditions, it cannot provide the evidence needed to test the above hypothesis. Indeed, the fact that conditions have so often been loaded in favor of "male" tasks raises the possibility that the entire female underconfidence generalization may be in error.

The research that we have been pursuing on this topic over the past few years is addressed specifically to the issues of task specificity and experience. Our general approach has been to compare males and females in both performance expectations and actual performance using both neutral tasks and "male-oriented" tasks for which experience could be monitored. Our predictions were (a) that there would be no sex differences on the former (neutral) kinds of tasks, and (b) that where initial differences exist, they would diminish as women gained experience concerning their own growing proficiency (i.e., as the initial male advantage in both proficiency and experience diminished).

Two separate experiments have been completed to date. The first involved a male-oriented motor task, dart-throwing, for which we predicted an initial confidence difference favoring men. We further hypothesized that after practice, women would show as much confidence as men, even on this "male" task.

The second study involved the prediction of grades in an introductory college course. This we considered a representative intellectual, cognitive task that should be neutral in sex stereotype; hence, we predicted no male-female confidence difference.

Study 1. Sixteen men and sixteen women were asked the following questions at the outset of the experiment.

> "If the average college female [or male for male subjects] were to throw 100 darts at that target, what percentage of their throws do you think would land within ring 7? 5? 9? 6?"

After the subject made his or her predictions, we asked,

> "If I were to give you 100 darts to throw, what percentage do you think would land within rings 9, 6, 5, 7?"

Each person's self-predictions were compared with his or her estimates for the typical same-sex college student in order to arrive at an estimate of initial confidence levels.

As shown in table 1, the majority of males felt that they could do better than the "average college male," while the majority of females felt they would do worse than the "average college female." The data are presented in two different ways: first, as a percentage of all judgments that were above, the same, or below the predictions for the undefined "average student" as seen by males and females; second, as the number of students in each group who gave a preponderance of judgments above, the same, or below their "average student" reference.

Following their initial confidence estimates, subjects practiced throwing darts for about thirty minutes a day for eight days. Performance feedback was provided in summary form as a total number of points earned on each ten

TABLE 1

DISTRIBUTION OF SUCCESS-RATE EXPECTATIONS EXPRESSED WITH REFERENCE TO UNSPECIFIED "AVERAGE PERSON" (Results for 16 male and 16 female college students)

BASIS OF DISTRIBUTION	EXPECTED SUCCESS OF PREDICTIONS		
	Above Average	Same as Average Person	Below Average
A. Percentage of all predictions that were above, the same, or below "average person"			
Male	48%	18.0%	34.0%
Female	39%	12.5%	48.5%
B. Number of subjects whose predominant expectations were above, the same, or below "average person"			
Male	8	2	6
Female	4	1	11

throws combined. However, the experimenter kept a separate record of the number of times each dart fell within each of the target rings in order to compute the subject's actual success rate for each level of task difficulty. On the ninth day, another series of questions was asked. This time the subjects were required to estimate how many darts in twenty they thought they could throw inside specified target rings. The targets were determined individually for each subject and represented rings within which the student had thrown successfully on 80%, 50%, or 20% of his or her recent attempts. In addition, subjects were asked once again to estimate the corresponding probabilities for the "average" reference person (same-sex college student) on the same target rings. Other tasks and questions intervened between the subject's predictions of his or her own performance and that of the reference person so that the subject would not be aware that these comparisons were being made. The results of these estimates are shown in table 2. As predicted, the initial difference between males and females had vanished by the ninth day of practice: if anything, the women were now slightly more confident than the men.

On the tenth and final day, subjects were presented with a choice of tasks: they could either throw a dart for a particular (specified) target ring or spin a "wheel-of-fortune" type spinner for a chance to win an identical sum of money (five cents). If the subject was successful on the chosen alternative, he

TABLE 2

SUCCESS EXPECTATIONS FOR 20-DART TASK WITH UNSPECIFIED "AVERAGE PERSON" AS REFERENCE
(Mean Probability Estimates)

BASIS FOR EXPECTATION	TASK DIFFICULTY OR OBJECTIVE SUCCESS PROBABILITY		
	.80	.50	.20
A. Estimated Probability of own success			
Males	.80	.49	.23
Females	.84	.57	.32
B. Estimated Probability of "Average Person's" Success			
Males	.62	.34	.16
Females	.69	.42	.21
C. Probability Difference (Self—"Average Person")			
Males	+.18	+.15	+.07
Females	+.15	+.15	+.11

or she would win the reward; failure resulted in neither reward nor penalty. A succession of choices was presented, after each of which the chosen alternative (skill or chance) was carried out. This continued for eighteen consecutive choices. Unknown to the subject, the probability of "winning" on six of those occasions was the same for both alternatives: .80-.80, .50-.50, .20-.20. We reasoned that the "more confident" subjects would prefer to rely on their own skill and thus choose to throw a dart rather than spin the spinner when the true chances of success were equal for both cases.

The number of times the subjects preferred the skill to the chance task when the probabilities were equal is shown in table 3.

Here, as in the case of the direct probability estimates (table 2), all evidence of a sex difference in self-confidence had disappeared. Both males and females preferred overwhelmingly to bet on themselves when their objective chances of success on both alternatives were equal. What accounts for the change from the situation that existed at the beginning of the experiment? Recalling our basic hypotheses, we can only conclude that the skill acquired through practice plus the knowledge of that skill gained through experience were sufficient to offset the initial deficiency. The women gained confidence quickly once they had the opportunity to experience success—the opportunity males had at the very outset.

TABLE 3

CHOICE PREFERENCES FOR SKILL (DART-THROWING) VS. CHANCE (WHEEL-OF-FORTUNE) TASKS WITH SUCCESS PROBABILITY EQUATED

SEX	FREQUENCY OF PREFERENCE	
	Skill	Chance
Males	73	23
Females	76	20

One question, however, remained unanswered. While we *assumed* that dart-throwing was a "male-stereotyped" task, and nothing in the experiment contradicted this assumption, we had not actually proven the point independently. To do this, twenty male and twenty female college students were surveyed and asked the following question:

"If we were to take a random sample of ten college women and ten college men and ask them to throw darts, who do you think would do better? And why?"

Over 90% of the males and 70% of the females indicated that males should show a superiority, and only 20% of the females thought that women would do better. The remainder of both groups predicted there would be no difference. The chief reason given for expecting male superiority was in essence that men had had more general experience in athletics, particularly in sports such as baseball that require throwing and aiming.

Reviewing the results of our first experiment, the evidence clearly supports the position that sex differences in self-confidence are task specific; in the sense that they represent differential experience (and social stereotypes rather than inherent differences between men and women).

Study 2. In our second study, the question was not whether an initial task-related difference could be moderated, but whether an initial comparability in task proficiency would produce comparable levels of self-confidence.

The task in this case was performance in introductory psychology as defined by test and overall course grades. As noted earlier, we considered this a cognitive, intellectual task in which neither males nor females would have an advantage insofar as social stereotype or experience was concerned.

A total of 176 students was involved in all phases of the study. In contrast with the first study, we predicted that women, having had experience in similar classes, would show initial confidence equal to that of men and would raise or lower their grade predictions in light of earlier test performance by an equal amount. (Other variables, which are not relevant to the present discussion, were also tested in this study.)

TABLE 4

DISTRIBUTION OF GRADE EXPECTATIONS AND FINAL COURSE GRADES FOR 172 INTRODUCTORY PSYCHOLOGY STUDENTS

BASIS OF DISTRIBUTION	GRADE EXPECTED OR REALIZED			
	A+, A, A-	B+, B, B-	C+, C, C-	<C-
A. Expressed Expectations[a]				
1. First exam grade				
Males	53.2%	37.2%	8.5%	1.1%
Females	51.3%	38.5%	10.3%	—
2. Second exam grade				
Males	70.2%	28.8%	1.1%	
Females	69.2%	25.6%	5.2%	
3. Minimum acceptable course grade				
Males	34.0%	55.3%	9.7%	1.1%
Females	46.2%	51.3%	2.6%	—
4. Expected course grade				
Males	73.4%	21.2%	5.4%	
Females	76.9%	23.2%	—	
B. Obtained Course Grade				
Males	54.4%	29.8%	12.6%	3.2%
Females	50.8%	41.6%	7.7%	—

a. Expectations 1, 3, and 4 were obtained through a questionnaire administered at the beginning of the semester. Predictions for the second exam were obtained after students received the first exam grade.

Subjects were asked to predict on a fifteen-point scale (1=A+, 15=F–) their final course grade, the minimum grade they would be satisfied to receive, and the grade they expected to make on the first exam in that class. After each exam, students were asked to indicate how much effort they expended studying, what factors they thought were responsible for their grade, and what grade they expected to make on their next exam.

Table 4 presents a summary of the resulting data. Consider first item #1. When asked what grade they expected to make on the first exam, males and females were virtually identical in their expectations. In predicting their final course grades, females were even a bit higher than males in their expectancies, although not significantly so. Following the first exam, both males and females increased their grade expectations for the second exam by an equal amount, providing direct support of our hypothesis.

To test neutrality of the task, a sample of twenty male and twenty female college students was asked whether they thought men or women would do

better in introductory psychology. As expected, over 90% of both sexes saw neither as having an advantage. Thus, whereas the first study showed that task-biased confidence differences can be eliminated through practice and experience, this one showed that such differences do not exist in the first place if tasks are equated.

Where does this leave us?

Having begun with Maccoby and Jacklin's perspective on the sex-difference literature—a perspective which will undoubtedly dominate thinking in this area for years to come—we may fittingly close by re-examining their position on self-confidence in light of what we have discovered.

Based on their exhaustive review, Maccoby and Jacklin conclude that lack of self-confidence in achievement-related tasks is, indeed, a rather general feminine trait. They speculate that the problem may lie, at least in part, in the tendency for women to perceive themselves as having less control over their own fates than do men.

Our position contrasts sharply with this rather pessimistic view. We believe, and our evidence seems to bear out this belief, that confidence differences are neither as widespread nor as inevitable as Maccoby and Jacklin contend. Rather than "perceived self-control," we would stress *knowledge* and *experience;* instead of *self*-perception, we would stress society's *task* perception.

We would suggest that women's lack of self-confidence is restricted primarily to activities in which society has discouraged their participation and hence prevented their achieving proficiency and the experience of success. They expect to do poorly because they are relatively inexperienced. They are inexperienced because society has, in both subtle and not-so-subtle ways, reserved these activities for males: female proficiency in a "male" task, like the reverse, carries a distinct social stigma. It may take a great deal of time for the stereotyping to vanish and for women to gain the proficiency that breeds confidence.

If there is a "real" sex difference in self-confidence, it could well lie in the fact that women are reluctant to forecast success for themselves in the absence of reliable supporting evidence; men, perhaps because of their wider range of experiences, their "machismo," their penchant for risk, or whatever, seem less hesitant. On the surface of it, there would appear to be at least some virtue in the former strategy. While it may be "she who hesitates" who fails to achieve in some situations, it is surely the "fools who rush in" who fail in others.

NOTES

Study 1 was conducted in conjunction with Martha Garcia and Study 2 in conjunction with Diana Rathjen and Elizabeth Sechler. I wish to thank Lewis Dratt for research in connection with this paper and William Howell for comments and suggestions on the final manuscript.

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